



BUNNELL-LAMMONS ENGINEERING, INC.
GEOTECHNICAL, ENVIRONMENTAL AND CONSTRUCTION MATERIALS CONSULTANTS

REPORT OF PHASE I ENVIRONMENTAL SITE ASSESSMENT AND LIMITED PHASE II ASSESSMENT

**Kiser Island Road Site (4)
Terrell, Catawba County, North Carolina**

Prepared for

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Prepared by

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February 21, 2000

BLE Project Number J99-1658-01

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BUNNELL-LAMMONS ENGINEERING, INC.
GEOTECHNICAL, ENVIRONMENTAL AND CONSTRUCTION MATERIALS CONSULTANTS

February 21, 2000

McGill Associates, P.A.
P. O. Box 2259
Asheville, NC 28802

Attention: Mr. John A. Orsillo, P.E.

Subject: **Report of Phase I Environmental Site Assessment and
Limited Phase II Environmental Site Assessment
Kiser Island Road Site (4)
Terrell, Catawba County, North Carolina
BLE Project No. J99-1658-01**

Dear Mr. Orsillo:


Bunnell-Lammons Engineering, Inc. (BLE) is pleased to submit this report of our Phase I Environmental Site Assessment (ESA) and Limited Phase II Soil and Ground-Water Sampling and Analysis for the approximately 46-acre site on Kiser Island Road in Terrell, Catawba County, North Carolina. The purpose of the Phase I ESA was to characterize the site and adjacent property conditions relative to environmental concerns. The purpose of the limited Phase II assessment was to determine if subsurface soils and/or ground water beneath the site have been contaminated by previous on-site and/or off-site operations. The results of sample analyses are attached.

The findings and recommendations contained herein are based on the data that was reviewed and documented in this report along with our experience on similar projects. The discovery of any additional information concerning the environmental conditions at the site should be reported to us for our review so that we can reassess potential environmental impacts and modify our recommendations, if necessary.

We appreciate the opportunity to be of service on this project. Please call us if you have any questions.

Sincerely,

BUNNELL-LAMMONS ENGINEERING, INC.



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Principal Geologist
Registered, North Carolina No. 1264



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Registered, North Carolina No. 18375

TABLE OF CONTENTS

| | Page No. |
|---|-----------|
| EXECUTIVE SUMMARY | ii |
| 1.0 INTRODUCTION..... | 1 |
| 2.0 PHASE I ENVIRONMENTAL SITE ASSESSMENT | 1 |
| 2.1 Hydrogeology | 2 |
| 2.2 Historical Review | 3 |
| 2.2.1 Site Uses..... | 3 |
| 2.2.2 Adjacent Land Uses..... | 3 |
| 2.3 Regulatory Listed Facilities and Landfills | 3 |
| 2.3.1 National Priorities List (NPL) | 4 |
| 2.3.2 Comprehensive Environmental Response Compensation and Liability Act (CERCLA) | 5 |
| 2.3.3 Resource Conservation and Recovery Act (RCRA) | 5 |
| 2.3.4 State Solid Waste Facilities and Landfills (LF) List..... | 5 |
| 2.3.5 Leaking Underground Storage Tank (LUST) List | 6 |
| 2.3.6 Underground Storage Tank (UST) List..... | 6 |
| 2.3.7 Emergency Response Notification System (ERNS)..... | 6 |
| 2.4 Site and Vicinity Reconnaissance | 7 |
| 2.4.1 Site Reconnaissance | 7 |
| 2.4.1.1 Property Description..... | 7 |
| 2.4.1.2 Underground Storage Tanks (USTs)..... | 7 |
| 2.4.1.3 Hazardous Materials..... | 7 |
| 2.4.1.4 Solid and Hazardous Waste | 7 |
| 2.4.1.5 PCB Containing Electrical Transformers | 7 |
| 2.4.1.6 Water Supply | 8 |
| 2.4.1.7 Wastewater..... | 8 |
| 2.4.1.8 Surface Staining and Stressed Vegetation | 8 |
| 2.4.1.9 Surface Drainage | 8 |
| 2.4.1.10 Conduits to Ground Water | 8 |
| 2.4.2 Area Reconnaissance..... | 8 |

TABLE OF CONTENTS (CONTINUED)

| | Page No. |
|---|----------|
| 2.5 Environmental Concerns..... | 9 |
| 2.6 Phase I ESA Conclusions and Recommendations..... | 9 |
| 3.0 LIMITED PHASE II ENVIRONMENTAL SITE ASSESSMENT..... | 9 |
| 3.1 Field Activities..... | 9 |
| 3.2 Results of Laboratory Analyses..... | 10 |
| 3.3 Conclusions and Recommendations..... | 11 |
| 4.0 QUALIFICATIONS OF REPORT..... | 11 |

FIGURES

- Figure 1 Site Location Map
- Figure 2 GeoProbe[®] Location Plan

APPENDICES

- Appendix I Report of Regulatory Review Lists
- Appendix II GeoProbe[®] Sampling Procedures
- Appendix III Laboratory Analytical Results

EXECUTIVE SUMMARY*Kiser Island Road Site (4)**Terrell, Catawba County, North Carolina*

McGill Associates, P.A. engaged Bunnell-Lammons Engineering, Inc. (BLE) to assess property that is currently owned by Crescent Resources, Inc. BLE performed a Phase I Environmental Site Assessment (ESA) and Limited Phase II Assessment of the subject site in accordance with BLE Proposal Number P99-0606, dated 12/05/99. A summary of our findings and recommendations is presented in the table below.

| PHASE I ASSESSMENT FINDINGS | RECOMMENDATIONS |
|--|---|
| The site consists of an approximate 46-acre tract of undeveloped land on Kiser Island Road. | The Phase I ESA did not identify areas on site of environmental concern. |
| The immediately surrounding properties are rural residential and undeveloped land. Beaverdam Creek of the Lake Norman Reservoir borders the west site boundary. No off-site property conditions were observed that pose environmental concern. | The Phase I ESA did not identify areas off site of environmental concern. |

| PHASE II ASSESSMENT FINDINGS | RECOMMENDATIONS |
|---|---|
| Soil and ground-water samples, GP-1 and GP-2, were collected on site using a Geoprobe to assess the existing site conditions. Petroleum hydrocarbons were not detected in the soil samples. No VOCs were detected in the ground-water samples. Chromium, lead and barium were detected as <i>total</i> metals in the ground-water samples. However, <i>dissolved</i> concentrations were not detected. In our opinion, the <i>total</i> metal concentrations are related to sample turbidity and natural background elements. No indication of contamination was observed. | In our opinion, these results do not suggest the presence of contamination. No further environmental assessment is recommended. |

1.0 INTRODUCTION

McGill Associates, P.A. (McGill) engaged BLE to perform a Phase I and Limited Phase II Environmental Site Assessment (ESA) of the subject approximately 46-acre site. The services were provided as outlined in BLE's Proposal Numbers P99-0606, dated 12/05/99. The property is currently owned by Crescent Resources, Inc. and consists of undeveloped land planted in young pine trees located on Kiser Island Road in Terrell, Catawba County, North Carolina (Figures 1 and 2). The west site boundary is bounded by Beaverdam Creek of the Lake Norman Reservoir. Historically, the property has been undeveloped land.

2.0 PHASE I ENVIRONMENTAL SITE ASSESSMENT

The purpose of this project was to identify obvious environmental concerns resulting from practices and activities that have occurred on the subject site or adjacent sites. It was not the purpose of the Phase I to determine the actual presence, degree, or extent of contamination by performing additional exploratory work, such as sampling and laboratory analysis except as noted herein for the Limited Phase II ESA.

The Phase I ESA is a general characterization of environmental concerns based on readily available information and site observations. The following services were provided for the assessment:

1. A qualitative hydrogeologic evaluation of the site and vicinity using both published topographic maps and area observations to characterize the area drainage and probable ground-water flow directions.
2. A review of readily available documents, maps, aerial photographs and interviews with knowledgeable persons to evaluate past land uses.
3. A review of available environmental reports published by state and federal agencies to determine if the site or nearby properties are listed as having a present or past environmental problem, are under investigation, or are regulated by state or federal environmental regulatory agencies.

4. A site and adjacent property reconnaissance for obvious indications of present or past activities that have or could contaminate the site.

2.1 Hydrogeology

Surface and subsurface drainage and geology are of interest since they indicate the direction from which off-site contaminants, if present, could be transported to the property.

The site is located within the Piedmont Physiographic Province. Based on published literature, the site is underlain at depth by granite rock. Other major geologic features, such as recent or active faults, are not documented for this area on the *Geologic Map of North Carolina*, dated 1985, or in *The Geology of the Carolinas*, dated 1991.

Hydrogeology is the study of ground-water movement through soil and rock. In this region, shallow ground water within the soils overlying the rock is typically unconfined. In most cases the water table is a subdued replica of the surface topography. Shallow ground water generally flows toward local drainage features that have eroded deeply enough to intersect the water table. Preferential flow patterns could result from such geologic features as bedding plains, changes in lithology, or fractures, if significantly present.

Based on our site observations and the USGS Topographic Map, 7.5 Minute Series, Lake Norman North, N.C. Quadrangle, dated 1993 (Figure 1), surface and ground water should flow to the west.

The term “upgradient” refers to a location topographically and hydraulically upstream of the site. Contaminants from an upgradient location could potentially impact the site if they were released on or beneath the ground surface. Conversely, a “downgradient location” would generally not have the potential to impact the site. The adjacent and nearby properties to the south and east are judged to be topographically upgradient.

2.2 Historical Review

BLE reviewed the following available information to determine the historical uses of the site and immediately adjacent properties, and to evaluate the presence of activity of potential environmental concern:

- Aerial photographs, dated 1991 and 1998, obtained from the Catawba County Tax Assessor's Office.
- Interview with Mr. Barry Edwards of Catawba County Engineers Office.
- Telephone interview with Mr. Mark Shields of Sherrills Ford Fire Department.

2.2.1 Site Uses

The subject 46-acre site is located on Kiser Island Road (Figure 2). Historically, the site has been wooded and undeveloped land.

2.2.2 Adjacent Land Uses

Based on our review of maps and aerial photographs, the adjacent surrounding properties have historically been residential and wooded land. Undeveloped land is contiguous to the north, south and west, and Kiser Island Road borders the site to the east since prior to the 1991 aerial photography. Beaverdam Creek of the Lake Norman Reservoir borders the west site boundary.

2.3 Regulatory Listed Facilities and Landfills

BLE evaluated potential environmental hazards in the vicinity of the site by reviewing readily available data published by the U.S. Environmental Protection Agency (EPA) and North Carolina Department of Environment and Natural Resources (NCDENR). Environmental Data Resources, Inc. (EDR) compiles and maintains current databases which were utilized to access the necessary records. Please note that these lists are limited, and include only sites that require environmental permits, have

the potential for contamination due to generation or handling of hazardous materials or are known to be contaminated. The radius of our search followed ASTM Practice for recommended minimum search distances. As described below, specific sites of concern may only be identified in the public record if they occur within the radius distance shown.

Federal Databases:

| | |
|-----------------|------------------------------|
| CERCLA | ½ mile |
| NPL | 1 mile |
| RCRIS/TSD | 1 mile |
| RCRA generators | property and adjoining sites |
| ERNS | property and adjoining sites |

North Carolina (State) Databases:

| | |
|----------------------------|------------------------------|
| State NPL (State SHWS) | 1 mile |
| Solid waste landfills (LF) | ½ mile |
| LUST | ½ mile |
| UST | property and adjoining sites |

2.3.1 National Priorities List (NPL)

The NPL is EPA's database of uncontrolled or abandoned hazardous waste facilities identified for priority remedial actions under the Federal Superfund Program. To be included on the NPL, a facility must either meet or surpass a predetermined hazard ranking system score, be chosen as a states top-priority facility, or meet other criteria. NCDENR also maintains a "state equivalent" to the federal NPL of hazardous waste sites (SHWS).

The site was not included on the NPL database reviewed, dated 07/22/99, nor were there NPL facilities listed within a one-mile radius of the site. In addition, the site was not on the state SHWS list reviewed, dated 02/04/99 (Appendix I).

2.3.2 Comprehensive Environmental Response Compensation and Liability Act (CERCLA)

The CERCLA Information System (CERCLIS) List compiles facilities for which EPA has investigated or is investigating a release or threatened release of hazardous substances that may be subject to review in accordance with the terms and conditions of CERCLA.

The site was not listed on the CERCLIS list reviewed, dated 08/26/99, nor were there CERCLIS listed facilities within a ½-mile radius of the site (Appendix I).

2.3.3 Resource Conservation and Recovery Act (RCRA)

The RCRA program identifies and tracks hazardous waste from the point of generation to the point of disposal. The RCRA database contains reporting facilities that generate, store, transport, treat, or dispose of hazardous waste. Registered RCRA facilities are those that have reported to EPA that they are handlers of hazardous waste. Some notifiers are listed for the purpose of protective filing, and may not actually generate or handle hazardous wastes. RCRA facilities listed by the EPA are not necessarily known polluters.

The site does not appear on the RCRA list, dated 09/01/99, nor were there RCRA facilities listed within a one-mile radius of the site (Appendix I).

2.3.4 State Solid Waste Facilities and Landfills (LF) List

NCDENR maintains lists of active and inactive landfills and disposal sites. The Municipal Solid Waste Landfill (MSWLF) listing includes known permitted landfills or dumps.

The site was not listed on the LF list reviewed, dated 10/01/99, nor were there LF facilities located within a ½-mile radius of the site (Appendix I).

2.3.5 Leaking Underground Storage Tank (LUST) List

The LUST list is a database of tank systems within the State of North Carolina that have reported releases of petroleum storage tank system contents.

The site did not appear on the LUST database, dated 10/26/99, nor were there LUST facilities within ½-mile radius of the site (Appendix I).

2.3.6 Underground Storage Tank (UST) List

The UST list is a database of tank systems within the State of North Carolina that are currently operated.

The site did not appear on the UST list reviewed, dated 11/16/99, nor were there UST facilities within a ½-mile radius of the site (Appendix I).

2.3.7 Emergency Response Notification System (ERNS)

The EPA ERNS stores information on releases of oil and hazardous substances. Releases are recorded in ERNS when they are initially reported to the federal government by any party. ERNS combines data from the National Response Center and the EPA.

The site was not listed on the EPA ERNS incident list, dated 10/28/99, nor were there ERNS listed facilities within a one-mile radius of the site (Appendix I).

We interviewed Mark Shields with the Sherrills Ford Fire Department regarding reported environmental spills. According to Mr. Shields, Fire Chief Keith Gabriel indicated that no spills or environmental incidents have been reported at the site.

2.4 Site and Vicinity Reconnaissance

A professional from our office experienced in environmental site assessments conducted a site and area reconnaissance on 12/14/99.

2.4.1 Site Reconnaissance

The site reconnaissance was performed to determine if there were obvious visual indications of present or past activities that have or could have contaminated the site. The site reconnaissance was conducted by automobile and on foot.

2.4.1.1 Property Description

The approximate 46-acre site is undeveloped. Young pine trees are planted on the relatively flat land.

2.4.1.2 Underground Storage Tanks (USTs)

Based on our file reviews and site observations, no indications of USTs were present on site.

2.4.1.3 Hazardous Materials

Based on our file review and site observations, no hazardous waste permits were obtained for the subject site. Additionally, no hazardous materials were observed on site.

2.4.1.4 Solid and Hazardous Waste

No solid wastes were observed to be generated or disposed on site.

2.4.1.5 PCB Containing Electrical Transformers

Electrical transformers have been known to be environmental concerns in some cases due to the potential presence of polychlorinated biphenyl (PCB) containing cooling oils used in some units.

During our reconnaissance, BLE did not observed pole-mounted electrical transformers on site.

2.4.1.6 Water Supply

Public water supply is not available at the site.

2.4.1.7 Wastewater

Public sewer service is not available at the site.

2.4.1.8 Surface Staining and Stressed Vegetation

No evidence of surface staining and/or stressed vegetation was observed at the subject site.

2.4.1.9 Surface Drainage

Based on topographic maps of the site and our site observations, surface water should drain to the west.

2.4.1.10 Conduits to Ground Water

No direct conduits to ground water were observed on the site.

2.4.2 Area Reconnaissance

BLE performed the area reconnaissance to determine if adjacent land uses have or could have contaminated the site. We toured the area by automobile and on foot and viewed surrounding businesses from public right-of-ways or by observations on site. Undeveloped land borders the site on the north and west, residential is to the south, and Kiser Island Road is contiguous to the east.

2.5 Environmental Concerns

This Phase I ESA did not identify areas of environmental concern on site or off-site.

2.6 Phase I ESA Conclusions and Recommendations

Based on the results of this Phase I ESA, no further assessment is recommended.

3.0 LIMITED PHASE II ENVIRONMENTAL SITE ASSESSMENT

3.1 Field Activities

As requested, a limited Phase II assessment was conducted to evaluate soil and ground-water quality on site. Soil and ground-water samples were collected on 01/10/00. The field procedures were as follows:

1. Using a GeoProbe[®] direct push (DP) drill rig, two soil and two ground-water samples were collected from the site. The samples were collected in laboratory-prepared containers.
2. The sample containers were marked in the field with identifying numbers, properly preserved, placed into sample coolers, secured, and maintained at less than 4 degrees Celsius. The samples and chain-of-custody records were delivered to Specialized Assays, Inc. analytical laboratory in Nashville, Tennessee, for chemical analysis.
3. The completed borings were backfilled with bentonite. The drilling methods used are described in Appendix II.

Soil samples were collected from borings GP-1 and GP-2. The sampling locations are shown on Figure 2. The soil samples were analyzed for total petroleum hydrocarbons (TPH) by EPA Method 8015B/3550. The laboratory analytical report is attached in Appendix III.

Ground-water samples were collected for GP-1 and GP-2. The sampling locations are shown on Figure 2. The ground-water samples were analyzed for volatile organic compounds (VOCs) by EPA Method 8260B and the eight RCRA metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver) by EPA Method 6010B. The laboratory analytical report is attached in Appendix III.

3.2 Results of Laboratory Analyses

No constituents were detected in the soil samples obtained from borings GP-1 and GP-2. No VOCs were detected in the ground-water samples from GP-1 and GP-2; however, *total* barium, chromium and lead were detected as indicated in the following table.

| | GP-1 | | GP-2 | | NC 2L Standards ¹ |
|--------------------|-------------|-----------|-------------|-----------|------------------------------|
| Constituent (mg/L) | Total | Dissolved | Total | Dissolved | Total |
| Barium | 0.61 | ND | 0.56 | ND | 2.0 |
| Chromium | 0.12 | ND | 0.26 | ND | 0.05 |
| Lead | 0.01 | ND | 0.06 | ND | 0.015 |

ND = Not detected

The level of *total* metals detected exceeds North Carolina 2L Standards for chromium in sample GP-1 and GP-2 and for lead in sample GP-2.

¹ Classifications and Water Quality Standards Applicable to the Ground-waters of North Carolina, North Carolina Administration Code Title 15, Subchapter 2L, Section .0100 through .0300.

3.3 Conclusions and Recommendations

Concentrations of *total* barium, *total* chromium and *total* lead were detected in both Geoprobe ground-water samples. Exceedances of the NC 2L Standards were detected in samples GP-1 (total chromium) and GP-2 (total chromium and total lead). The NC 2L Standards are based on allowable *total* metal concentrations.

For comparative purposes and to evaluate the significance of these metal concentrations, the samples were also analyzed for *dissolved* metals. *Dissolved* metals were not detected at the laboratory detection limits.

Total metal concentrations are typically detected in turbid ground-water samples because metal cations readily adsorb to suspended silt and clay particles via electrostatic charges (Barcelona, 1990; Hem, 1989)². However, when *dissolved* metals are measured in filtered water samples (<10 micron) – the metal concentrations are usually significantly lower. Because of the sampling methodology, Geoprobe samples are always highly turbid when collected from fine-grained formations. In our opinion, the total metal concentrations detected at Site 4 are likely a function of the sample turbidity and are related to natural background soil constituents rather than contamination. Metal cations of barium, lead and chromium are common weathering byproducts of the natural bedrock in the region.

It is our opinion that there is no evidence of contamination at the site.

4.0 QUALIFICATIONS OF REPORT

The Phase I ESA was performed in general accordance with ASTM E 1527. The findings are relevant to the date of our site work and should not be relied upon to represent site conditions on other

² Barcelona, Michael J., 1990, "Uncertainties in Ground-Water Chemistry and Sampling Procedures", American Chemical Society Symposium Series 416: Chemical Modeling of Aqueous Systems II, Chapter 24, pp. 310-320.

Hem, J.D., 1989, Study and Interpretation of the Chemical Characteristics of Natural Water, Third Edition, USGS Waters-Supply Paper 2254, 263 pages.

dates. Under ASTM, a Phase I ESA is considered to be representative of site conditions for a period of 180 days from the date of issuance. In most cases, a Phase I ESA may be used more than 180 days after the date of issuance, provided that additional reconnaissance of the site, interviews, and an updated regulatory listing review are performed.

Although this assessment has attempted to identify the potential for contamination of the subject property, potential sources of contamination may have escaped detection due to: (1) the limited scope of this assessment, (2) the inaccuracy of public records, and (3) the presence of undetected and unreported environmental incidents.

The Phase II sampling activities and evaluative approaches are consistent with those normally employed in hydrogeological assessments and waste-management projects of this type. Our evaluation of site conditions has been based on our understanding of the site and project information, and the data obtained in our exploration.

Regardless of the thoroughness of an environmental site assessment, there is always the possibility that conditions between wells and borings will be different from that at the specific well or boring location due to the variability of subsurface conditions. Therefore, it was not possible to identify all conceivable forms of contamination at this site. The primary objective was to perform sufficient work to assess specific areas of concern that were identified during a Phase I ESA and Limited Phase II Assessment of the subject site. It was not the purpose of this evaluation to fully define the degree or extent of all forms of contamination.

Please note, the reported scope of services were performed for McGill Associates and Catawba County and this report may or may not be suitable for any and all purposes outside of Catawba Counties specific intent. Also, the rights of Catawba County to rely on this report are expressly subject to the limitations and qualifications contained in the report and the terms and conditions between McGill Associates and BLE, including any limitations contained therein. A copy of these terms and conditions between BLE and McGill Associates can be made available upon request.

BLE has performed its services with that degree of skill and care ordinarily exercised by reputable members of BLE's profession in the same or similar locality. No other warranty, expressed or implied, is made or intended.

McGill Associates and Catawba County agree that BLE's report is intended for their exclusive reliance and internal use, and is not for general distribution or publication. Without the prior consent of BLE, any unauthorized use or distribution shall be at secondary party's sole risk and without liability to BLE.

By request and/or use of the referenced report, any secondary party expressly agrees to waive all claims of existing or potential conflicts of interest that may now exist or hereafter arise by BLE's providing the requested report and acknowledges BLE's right to support Client, if requested, should any dispute arise between Client and secondary party.